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| 10/051,867      | 01/15/2002  | Ewald Guenther       | 2001 P 08373 US     | 1665             |

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Siemens Corporation  
Attn: Elsa Keller, Legal Administrator  
Intellectual Property Department  
186 Wood Avenue South  
Iselin, NJ 08830

EXAMINER

DOLAN, JENNIFER M

ART UNIT

PAPER NUMBER

2813

DATE MAILED: 11/13/2002

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Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/051,867

Applicant(s)

GUENTHER ET AL.

Examiner

Jennifer M. Dolan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 3-5, 7, 8, 12, and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No 5,965,907 to Huang et al.

Regarding claim 1, Huang discloses a device (figures 1 and 2) comprising a plurality of substrates (12) mounted vertically in a stacked structure (figure 2), each substrate having active components (14,15,24) emitting light of a given wavelength through the stacked structure towards a viewing surface (60; column 3, line 53 – column 4, line 18).

Regarding claim 3, Huang discloses that the substrate material comprises glass (column 3, lines 25 – 26).

Regarding claim 4, Huang discloses that the plurality of substrates are mounted in an order whereby light with the shortest wavelength (blue light from 58) is emitted closest to the viewing surface (column 4, lines 13 – 18; figure 2).

Regarding claims 5 and 7, Huang discloses that the active components (14,15,24) are distributed on the surface of each substrate (figure 1 and 2).

Regarding claim 8, Huang discloses that the active components comprise one or more organic layers (15) sandwiched between first (14) and second (24) conductive layers (figures 1 and 2).

Regarding claim 12, Huang discloses that the first conductive layer comprises an opaque material (column 3, lines 30-32).

Regarding claim 13, Huang discloses that the first conductive layer comprises a metallic material (column 3, lines 30-32).

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 2 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huang et al. in view of U.S. Patent Application Publication No. 2002/0135296 to Aziz et al.

Regarding claim 2, Huang is silent as to the thickness of the substrate.

Aziz discloses a light-emitting device with a transparent substrate (paragraph 0071) having a thickness of 0.1 to 1 mm (paragraph 0072), which encompasses the range claimed in the present application.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to specify in Huang a substrate thickness of less than 0.5 mm. The rationale is as follows: One of ordinary skill in the art at the time the invention was made would have been

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motivated to provide a substrate of less than 0.5 mm, because thicknesses in that range are considered suitable for light emitting device applications (Aziz, paragraph 0072), and the selection of a particular thickness is a matter of routine optimization of the substrate thickness based on the structural demands of the device (Aziz, paragraph 0072). Although neither Huang nor Aziz specify that the substrate must be less than 0.5 mm thick, it has been held that “where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.” *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (1955).

Regarding claim 11, Huang is silent as to the thickness of the first and second conductive layers.

Aziz discloses thicknesses of the first (12,22,32, and 42) conductive layer of 0.001-5 microns, with a preferred range of 0.03 – 0.3 microns (paragraph 0075); and thicknesses of the second (18, 28, 38, and 48) conductive layer of 0.01 – 0.5 nm (paragraph 0099), which intersects the ranges claimed in the present application.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to specify that the conductive layers of Huang have thicknesses of about 0.02 – 1 micron, as taught by Aziz. The rationale is as follows: One of ordinary skill in the art at the time the invention was made would have been motivated to specify thicknesses of about 0.02-1 micron, because such thicknesses are suitable and preferred for light emitting device structures similar to that of Huang and of the present application (Aziz, paragraphs 0075 and 0099). Although the exact range of 0.02-1.0 microns was not disclosed by Huang or Aziz, it has been held that “where the general conditions of a claim are disclosed in the prior art, it is not inventive

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to discover the optimum or workable ranges by routine experimentation.” *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (1955).

5. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Huang et al. in view of U.S. Patent No 5,739,552 to Kimura et al.

Regarding claim 6, Huang fails to disclose that the surface of each substrate is punctured and staggered.

Kimura discloses that the surface of each substrate (1, 10, 20) is punctured (figures 8a-8d) and staggered (figure 1e).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the substrates of Huang such that they are punctured and staggered, as taught by Kimura. The rationale is as follows: One of ordinary skill in the art at the time the invention was made would have been motivated to provide substrates with staggered surfaces, in order to allow for the placement of contact electrodes for the lower LEDs (Kimura, figure 1e). A person having ordinary skill would further have been motivated to puncture the surface of each substrate, in order to decrease the total height of the device (figure 8d) by allowing the LED layers to be stacked in and under the plane of the substrate, rather than on top of the substrate, and to allow the device electrodes to be in the same plane as the device, thus decreasing the need for complicated processing (Kimura, column 14, lines 52 – 67).

6. Claims 9, 10, and 14 – 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huang et al. in view of U.S. Patent No. 6,117,529 to Leising et al.

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Regarding claim 14, Huang fails to disclose that the first conductive layers comprise a non-overlapping pattern to allow a clear optical path for the emitted light.

Leising discloses first conductive layers (2) that comprise a non-overlapping pattern (figures 1-3) to allow a clear optical path for the emitted light (figures 1-3).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the first conductive layers of Huang so that they comprise a non-overlapping pattern, as taught by Leising. The rationale is as follows: One of ordinary skill in the art at the time the invention was made would have been motivated to dispose the first conductive layers in a non-overlapping pattern, in order to improve the separation between individual color pixel areas, which improves sharpness of the emitted light, as well as prevent short circuits between neighboring electrodes (Leising, column 6, line 53 – column 7, line 6).

Regarding claim 15, Huang fails to disclose that the pattern of the first conductive layers comprises strips.

Leising discloses that the pattern of the first conductive layer comprises strips (figures 1-3; column 6, lines 57 – 59).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the conductive layer of Huang so that the pattern is formed in strips, as taught by Leising. The rationale is as follows: One of ordinary skill in the art at the time the invention was made would have been motivated to provide the conductive layers in strips, because the strips allow for an evenly distributed application of current density over a large area to the light emitting device, while still allowing for a relatively small separation between light emitting devices, such that a continuous display can be achieved.

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Regarding claims 9 and 16, Huang fails to disclose that the organic layers comprise a non-overlapping pattern to allow a clear optical path for the emitted light.

Leising discloses that the organic layers (3) comprise a non-overlapping pattern (figures 1-3; column 6, lines 62 – 65) to allow a clear optical path for the emitted light.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the organic layers of Huang so that they form a non-overlapping pattern, as taught by Leising. The rationale is as follows: One of ordinary skill in the art at the time the invention was made would have been motivated to provide a non-overlapping pattern, in order to increase the separation between individual light emitting elements, such that the display sharpness and contrast are enhanced (Leising, column 5, lines 27 – 41; column 6, line 53 – column 7, line 5).

Regarding claims 10 and 17, Huang fails to disclose that the pattern of the organic layers comprises strips.

Leising discloses that the pattern of the organic layers comprises strips (column 6, lines 62 – 65).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the organic layers of Huang so that they form strips, as taught by Leising. The rationale is as follows: One of ordinary skill in the art at the time the invention was made would have been motivated to arrange the organic layers in strips, because strips allow the individual pixels to be sufficiently close to form a continuous display, but also the pixels are sufficiently separated, such that the sharpness and contrast of a display are improved (column 6, line 53 – column 7, line 5).



7. Claims 18, 19, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huang et al. in view of U.S. Patent No. 6,211,538 to Park.

Regarding claim 18, Huang fails to disclose that the active components are distributed on a first surface and a second surface of each substrate.

Park discloses that the active components (430 and 450) are distributed on a first surface and a second surface of the substrate (410; figure 4).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device structure of Huang such that active components are distributed on first and second surfaces of the substrate, as taught by Park. The rationale is as follows: One of ordinary skill in the art at the time the invention was made would have been motivated to distribute active components on both sides of the substrate, in order to further separate the light emitting elements, so that the electrodes don't short each other and so that the light paths don't interfere. Additionally, it's advantageous to dispose the layered structures for each light emitting element on a planar substrate surface than it is to deposit one element on top of the other element, because layer deposition or growth on top of an uneven or already processed layer tends to lead to crystallinity and growth defects, as is appreciated by one skilled in the art. Because Park shows that structures wherein active components are distributed solely on one side of a substrate (figures 1 and 2), and structures wherein active components are distributed on two surfaces of a substrate (figures 3 and 4) are essentially equivalent and can be used interchangeably, it is well within the purview of a person having ordinary skill in the art to select

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an arrangement with active components distributed on both surfaces of the substrate for the advantages listed supra.

Regarding claim 19, Huang discloses that the active components comprise one or more organic layers (15) sandwiched between first (14) and second (24) conductive layers (figures 1 and 2).

Regarding claim 21, Huang discloses that the first conductive layer comprises an opaque material (column 3, lines 30-32).

8. Claims 20, 22, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huang et al. in view of Park as applied to claims 19 and 21 above, and further in view of Leising et al.

Regarding claim 22, Huang fails to disclose that the first conductive layers comprise a non-overlapping pattern to allow a clear optical path for the emitted light.

Leising discloses first conductive layers (2) that comprise a non-overlapping pattern (figures 1-3) to allow a clear optical path for the emitted light (figures 1-3).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the first conductive layers of Huang as modified by Park so that they comprise a non-overlapping pattern, as taught by Leising. The rationale is as follows: One of ordinary skill in the art at the time the invention was made would have been motivated to dispose the first conductive layers in a non-overlapping pattern, in order to improve the separation between individual color pixel areas, which improves sharpness of the emitted light, as well as

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prevent short circuits between neighboring electrodes (Leising, column 6, line 53 – column 7, line 6).

Regarding claims 20 and 23, Huang fails to disclose that the organic layers comprise a non-overlapping pattern to allow a clear optical path for the emitted light.

Leising discloses that the organic layers (3) comprise a non-overlapping pattern (figures 1-3; column 6, lines 62 – 65) to allow a clear optical path for the emitted light.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the organic layers of Huang as modified by Park, so that they form a non-overlapping pattern, as taught by Leising. The rationale is as follows: One of ordinary skill in the art at the time the invention was made would have been motivated to provide a non-overlapping pattern, in order to increase the separation between individual light emitting elements, such that the display sharpness and contrast are enhanced (Leising, column 5, lines 27 – 41; column 6, line 53 – column 7, line 5).

### ***Conclusion***

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent Application Publication No. 2002/0079834 to Dai et al. discloses a full color LED display using a plurality of staggered substrates.

U.S. Patent No. 6,060,727 to Shakuda discloses a light-emitting device with a common substrate supporting a plurality of different wavelength laminate structures.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer M. Dolan whose telephone number is (703) 305-3233. The examiner can normally be reached on Monday-Friday 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl W. Whitehead, Jr. can be reached on (703) 305-4940. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Jennifer M. Dolan  
Examiner  
Art Unit 2813

jmd  
October 28, 2002

  
CARL WHITEHEAD, JR.  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800